

# HiPerFET™

## Power MOSFET

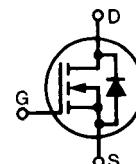
N-Channel Enhancement Mode  
Avalanche Rated, High dv/dt, Low  $t_{rr}$

Preliminary data

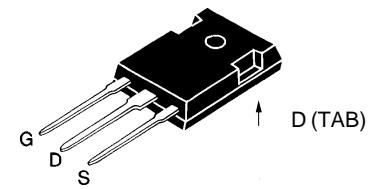
Symbol	Test Conditions	Maximum Ratings		
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	550	V	
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	550	V	
$V_{GS}$	Continuous	$\pm 20$	V	
$V_{GSM}$	Transient	$\pm 30$	V	
$I_{D25}$	$T_c = 25^\circ\text{C}$	22	A	
$I_{DM}$	$T_c = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	88	A	
$I_{AR}$	$T_c = 25^\circ\text{C}$	22	A	
$E_{AR}$	$T_c = 25^\circ\text{C}$	30	mJ	
$dv/dt$	$I_s \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$	5	V/ns	
$P_D$	$T_c = 25^\circ\text{C}$	300	W	
$T_J$		-55 ... +150	$^\circ\text{C}$	
$T_{JM}$		150	$^\circ\text{C}$	
$T_{stg}$		-55 ... +150	$^\circ\text{C}$	
$T_L$	1.6 mm (0.063 in) from case for 10 s	300	$^\circ\text{C}$	
$M_d$	Mounting torque	1.13/10	Nm/lb.in.	
<b>Weight</b>		6	g	

## IXFH22N55

$V_{DSS} = 550 \text{ V}$   
 $I_{D(\text{cont})} = 22 \text{ A}$   
 $R_{DS(\text{on})} = 0.27 \Omega$   
 $t_{rr} \leq 250 \text{ ns}$



TO-247 AD



G = Gate,  
S = Source,  
D = Drain,  
TAB = Drain

### Features

- International standard packages  
JEDEC TO-247 AD
- Low  $R_{DS(\text{on})}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance (< 5 nH)
  - easy to drive and to protect
- Fast intrinsic Rectifier

### Applications

- Power Factor Control Circuits
- Uninterruptible Power Supplies (UPS)
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

### Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values		
		( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	min.	typ.
$V_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$	550		V
$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$ , $I_D = 4 \text{ mA}$	2	4.5	V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$		$\pm 100$	nA
$I_{DSS}$	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	250 1	$\mu\text{A}$ mA
$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle d $\leq 2 \%$		0.27	$\Omega$

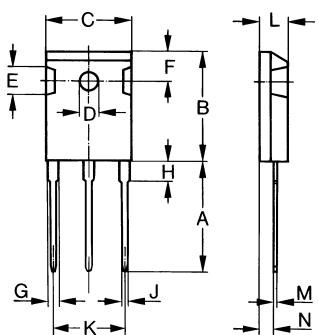
Symbol	Test Conditions	Characteristic Values			
		( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	min.	typ.	max.
$g_{fs}$	$V_{DS} = 10 \text{ V}; I_D = 0.5 I_{D25}$ , pulse test	11	18	S	
$C_{iss}$ $C_{oss}$ $C_{rss}$	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	4200		pF	
		450		pF	
		135		pF	
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$ , $R_G = 2 \Omega$ (External)	20	40	ns	
		43	60	ns	
		70	90	ns	
		40	60	ns	
$Q_{g(on)}$ $Q_{gs}$ $Q_{gd}$	$V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$	150	170	nC	
		29	40	nC	
		60	85	nC	
$R_{thJC}$			0.42	K/W	
$R_{thCK}$		0.15		K/W	

## Source-Drain Diode

Characteristic Values  
( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	min.	typ.	max.
$I_s$	$V_{GS} = 0 \text{ V}$		22	A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$		88	A
$V_{SD}$	$I_F = I_s, V_{GS} = 0 \text{ V}$ , Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $\delta \leq 2 \%$		1.5	V
$t_{rr}$	$I_F = I_s$ , $-di/dt = 100 \text{ A}/\mu\text{s}$ , $V_R = 100 \text{ V}$ $T_J = 125^\circ\text{C}$		250	ns
			400	ns

## TO-247 AD Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

Fig. 1 Output Characteristics

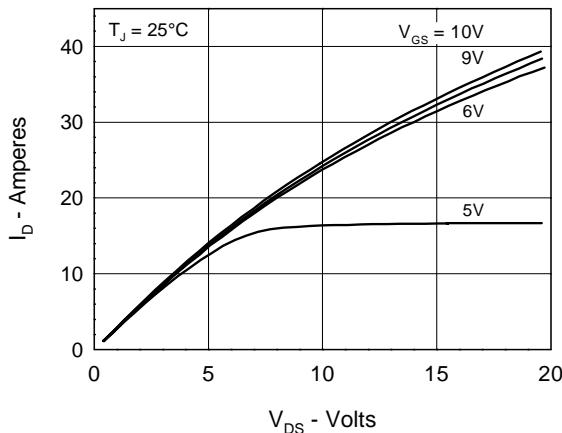


Fig. 2 Input Admittance

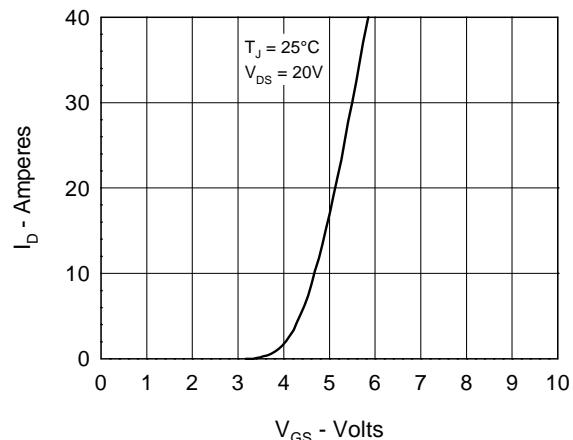
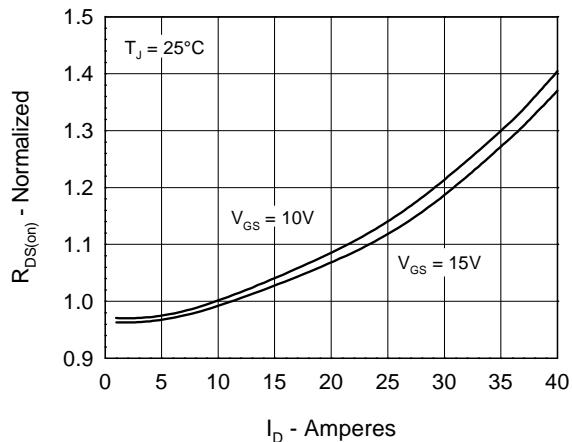
Fig. 3  $R_{DS(on)}$  vs. Drain Current

Fig. 4 Temperature Dependence of Drain to Source Resistance

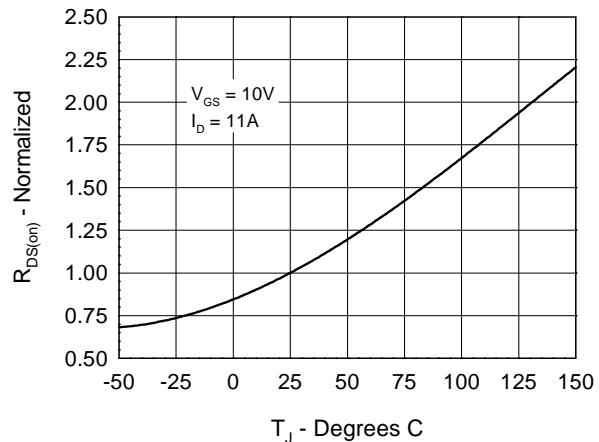


Fig. 5 Drain Current vs. Case Temperature

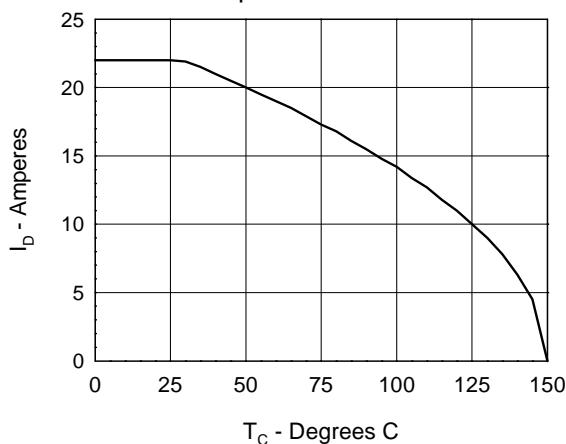


Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage

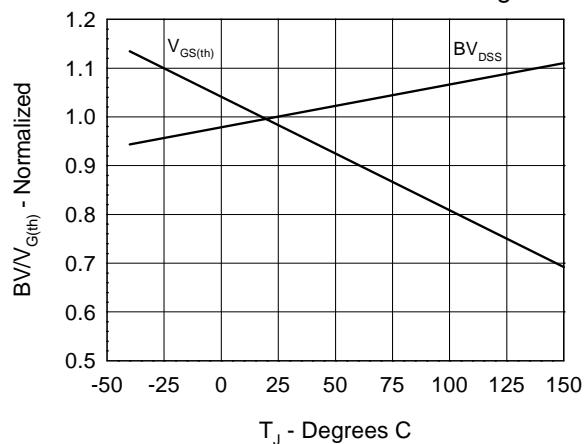


Fig.7 Gate Charge Characteristic Curve

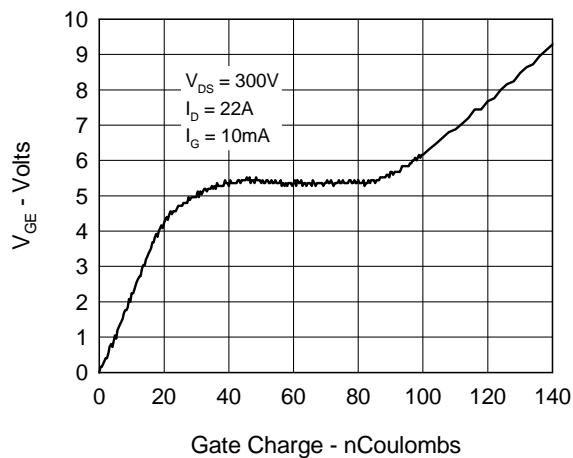


Fig.8 Forward Bias Safe Operating Area

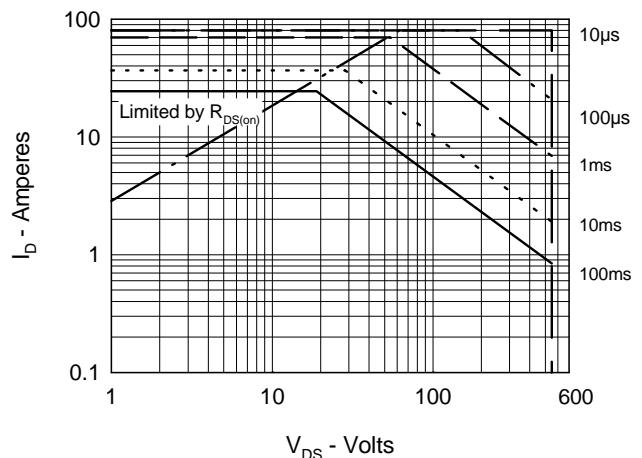


Fig.9 Capacitance Curves

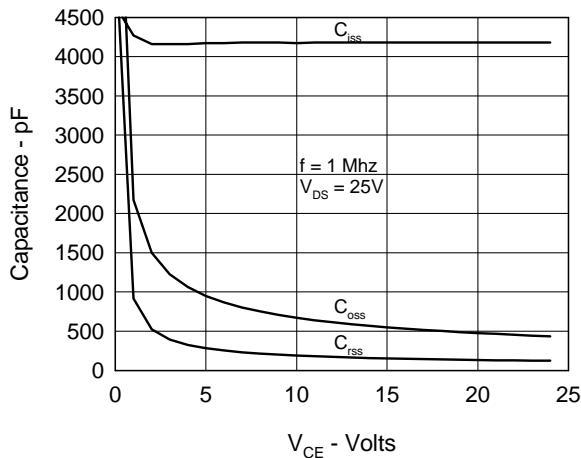


Fig.10 Source Current vs. Source to Drain Voltage

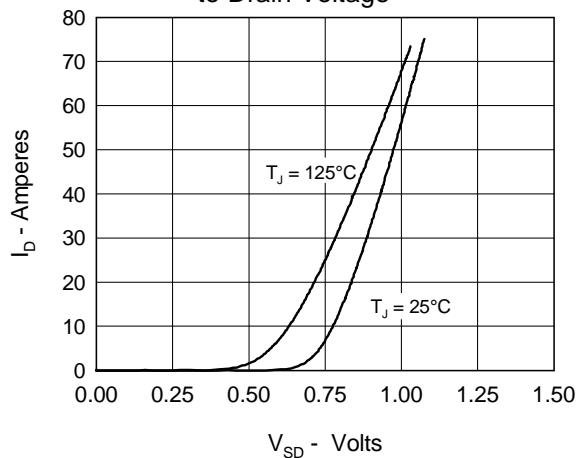


Fig.11 Transient Thermal Impedance

